Test Report

Verified code: 430269

Report No.: E20240407651301-4

Customer:	Lumi United Technology Co., Ltd.
Address:	Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China
Sample Name:	Presence Sensor FP1E
Sample Model:	PS-S03D
Receive Sample Date:	Apr.08,2024
Test Date:	Apr.09,2024 ~ Apr.15,2024
Reference Document:	AS/NZS 2772.2:2016
Test Result:	Pass

Prepared by: Lu Wei — Lu Wei

Reviewed by: Wu Haoting — Wu Haoting

Approved by: Xiao Liang — Xiao Liang

GUANGZHOU GRG METROLOGY & TEST CO., LTD

Issued Date: 2024-05-27

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Statement

1. The report is invalid without "special seal for inspection and testing"; some copies are invalid; The report is invalid if it is altered or missing; The report is invalid without the signature of the person who prepared, reviewed and approved it.

2. The sample information is provided by the client and responsible for its authenticity; The content of the report is only valid for the samples sent this time.

3. When there are reports in both Chinese and English, the Chinese version will prevail when the language problems are inconsistent.

4. If there is any objection concerning the report, please inform us within 15 days from the date of receiving the report.

5. Without the agreement of the laboratory, the client is not authorized to use the test results for unapproved propaganda.

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REPORT ISSUED HISTORY

Report Version	Report No.	Description	Compile Date
1.0	20240407651301-4	Original Issue	2024-05-27

Note:

1). The maximum output power of radar were refer to the report 2402S31167-14 which issued on 27-05-2024 by Bay Area Compliance Laboratories Corp. (Dongguan).

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1 GENERAL DESCRIPTION OF EUT

1.1 APPLICANT INFORMATION

Name:	Lumi United Technology Co., Ltd.
Address:	Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China

1.2 MANUFACTURER

Name:	Lumi United Technology Co., Ltd.
Address:	Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China

1.3 BASIC DESCRIPTION OF EUT

Product Name:	Presence Sensor FP1E
Product Model:	PS-S03D
Adding Model:	PS-S03E
Model different description:	PS-S03D and PS-S03E have the same technical construction including circuit diagram, PCB LAYOUT, hardware version and software version identical, except sales area and packaging are different.
Trade Name:	Aqara
Power Supply:	DC 5V,1A
Frequency Band:	ZigBee: 2405MHz-2480MHz Radar: 60000MHz-61500MHz
Modulation Type:	ZigBee: O-QPSK Radar: FMCW
Antenna Specification:	ZigBee: PIFA antenna 2.0dBi gain (Max.) Radar: Integrated in chip antenna with 5.0dBi gain (Max)
Hardware Version:	T1
Software Version:	V.1
Sample submitting way:	■Provided by customer □Sampling
Sample No:	E20240407651301-0001, E20240407651301-0002, E20240407651301-0003
Note:	The EUT antenna gain is provided by the applicant. This report is made solely on the basis of such data and/or information. We accept no responsibility for the authenticity and completeness of the above data and information and the validity of the results and/or conclusions.

2 LABORATORY AND ACCREDITATIONS

2.1 LABORATORY

The tests & measurements refer to this report were performed by Shenzhen EMC Laboratory of GRG METROLOGY & TEST GROUP CO., LTD.

Add.:	No.1301 Guanguang Road Xinlan Community, Guanlan Street, Longhua District Shenzhen, 518110, People's Republic of China.
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2.2 ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

China	CNAS(L0446)

Copies of granted accreditation certificates are available for downloading from our web site, http://www.grgtest.com

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3 TECHNICAL REQUIREMENTS SPECIFICATION IN

3.1 RF EXPOSURE EVALUATION

The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), an agency of the (Australian) Commonwealth Department of Health, has established a Radiation Protection Standard specifying limits for continuous exposure of the general public to RF fields.

REFERENCE LEVELS FOR TIME AVERAGED EXPOSURETO RMS ELECTRIC AND MAGNETIC FIELDS (UNPERTURBED)

Exposure	Frequency range	*E*-field strength V/m rms	*H*-field strength V/m rms	Power flux density W/m^2
Occupational (RF worker)	100 kHz-1 MHz	614	1.63/*f*	N/A
	1 MHz-10 MHz	614/*f*	1.63/*f*	1000/*f* ^{2}
	10 MHz-400 MHz	0.163	0.163	10
	400 MHz-2 GHz	3.07 * *f* $^{0.5}$	0.00814 * *f* $^{0.5}$	*f*/40
	2 GHz-300 GHz	137	0.364	50
Non-Occupational (general public)	100 kHz-150 kHz	86.8	4.86	N/A
	150 kHz-1 MHz	86.8	0.729/*f*	N/A
	1 MHz-10 MHz	86.8 * *f* $^{0.5}$	0.729/*f*	N/A
	10 MHz-400 MHz	27.4	0.0729	2.0
	400 MHz-2 GHz	1.37 * *f* $^{0.5}$	0.00364 * *f* $^{0.5}$	*f*/200
	2 GHz-300 GHz	61.4	0.163	10.0

Notes:

1) *f* is frequency, in MHz.
2) There are also applicable limits for exposure to instantaneous rms electric and magnetic fields (unperturbed fields), These limits are less restrictive than the limits specified and as a result are not referenced in this measurement report.

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3.2 EVALUATION RESULTS

Antenna Specification

Mode	Antenna type	Internal Identification	Maximum antenna gain
ZigBee	PIFA antenna	Antenna 1	2.0dBi
Radar	Integrated in chip antenna	Antenna 2	5.0dBi

Operating Mode with Modulation						
Mode	**Max. Output Power (dBm)**	**Gain (dBi)**	**EIRP Power (dBm)**	**Frequency Band(MHz)**	**Power Density (W/m ²)**	**Limit of Power Density (W/m ²)**
ZigBee	7.35	2.0	9.35	2405-2480	0.0171	10
Radar	/	5.0	10.23	60000-61500	0.0210	10

Note：

The field calculation does not take into account the antenna size, which is assumed to be a point source. An ideal isotropic antenna is used as a reference to compare the performance of practical antennas: *P* watts is radiated, from a point, uniformly over the surface of sphere of radius *R*. Assumed use distance from EUT to Human, **20 cm** separation distance warning is required.

The Formula

$$S = \frac{P}{4\pi R^2}$$

Whereas,

S = power density

R=distance from observation point to the antenna（m）

P= The maximum e.i.r.p of the transmitter（W） .

In this section, the power density at 20 cm location is calculated to examine if it is lower than the limit.

For simultaneously transmit system:

When multiple sources are introduced into an environment, it becomes necessary to address the sources interdependently, since each source will contribute some percentage of the ME toward the total exposure at a fixed location. The sum of the ratios of the exposure from each source (expressed as a plane-wave equivalent power density) to the corresponding ME for the frequency of each source is evaluated. The exposure complies with the ME if the sum of the ratios is less than unity, i.e.,

$$\sum_{i=1}^{n} \frac{S_{E_i}(duty\ factor)}{MPE_{E_i}} < 1$$

and

$$\sum_{i=1}^{n} \frac{S_{H_i}(duty\ factor)}{MPE_{H_i}} < 1$$

For the calculated power density should comply with:

$$\sum_{i=1}^{n} \frac{S_i}{MPE_i} < 1$$

For simultaneously transmit result:

Max. ZigBee + Max. Radar:
ZigBee Power Density / Limit of Power Density + Radar Power Density / Limit of Power Density = 0.0171(W/m ²)/10 (W/m ²) + 0.0210 (W/m ²)/10 (W/m ²) = 0.0038<1.

The test result is passed.

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4 APPENDIX A:PHOTOGRAPH OF THE EUT

Please refer to the attached document E20240407651301-EUT Photo.

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